



# **Armed Forces College of Medicine**

## **AFCM**

## Soft tissue tumors



- They include mesenchymal tumors **other than bone and cartilage**.
- Current evidence indicates that these tumors arise from ***pluripotent mesenchymal cells*** and not mature mesenchymal cells.
- **Benign soft tissue tumors are much more common.**

Tumors of adipose tissue	1. Lipoma.	2. Liposarcoma
Tumors of fibrous tissue	1. Fibroma	2. Fibrosarcoma
Tumors of smooth muscles	1. Leiomyoma	2. Leiomyosarcoma
Vascular tumors	1. Hemangioma 3. Hemangioendothelioma 4. angiosarcoma	2. Lymphangioma

# Lipoma

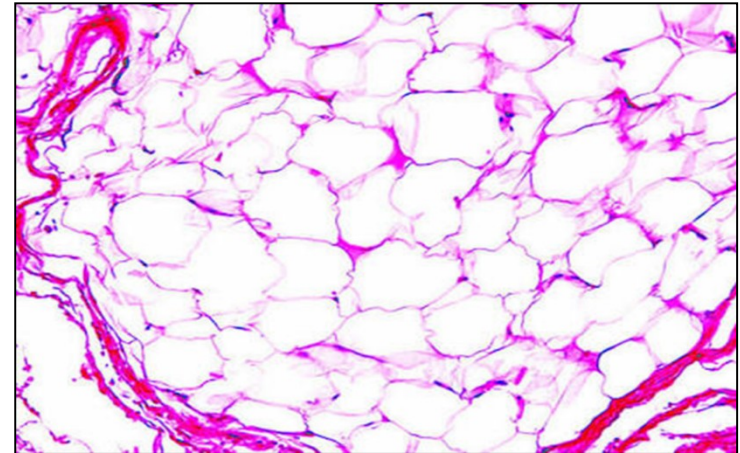


**Lipoma: is the most common soft tissue tumor.**

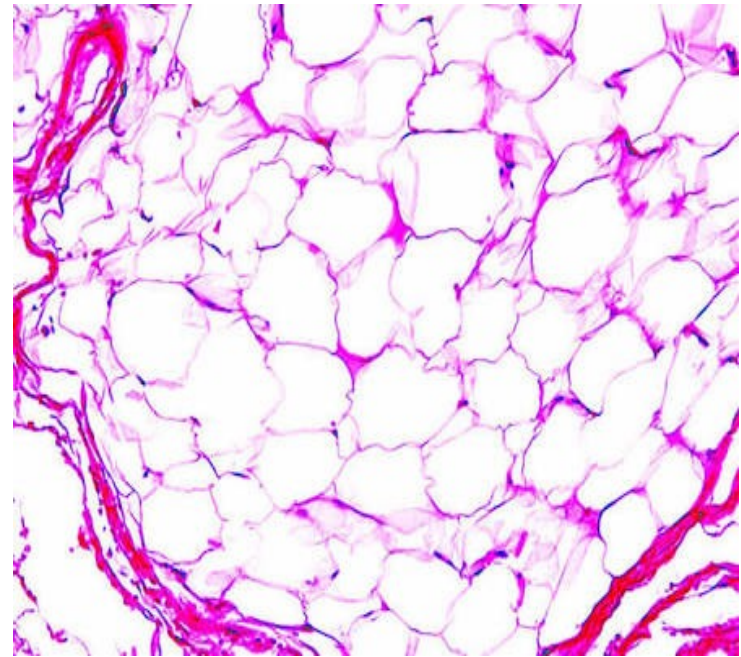
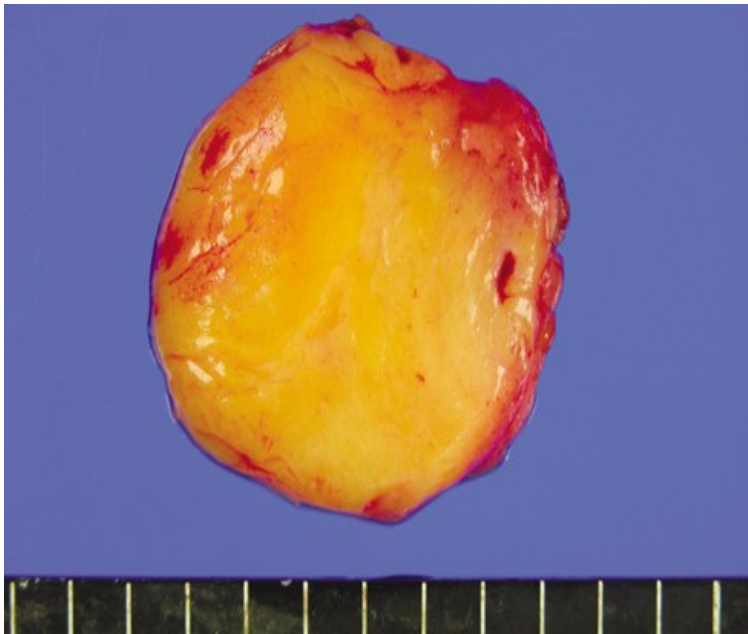
It is a slowly growing **benign** tumor of adipose tissue that arise from **subcutaneous, intramuscular, or visceral** locations.

**Gross picture: well defined mass with yellowish soft lobulated greasy cut surface.**

**Microscopic picture: capsulated with delicate vascularized fibrous septae dividing the tumor into lobules formed of mature fat cells.**



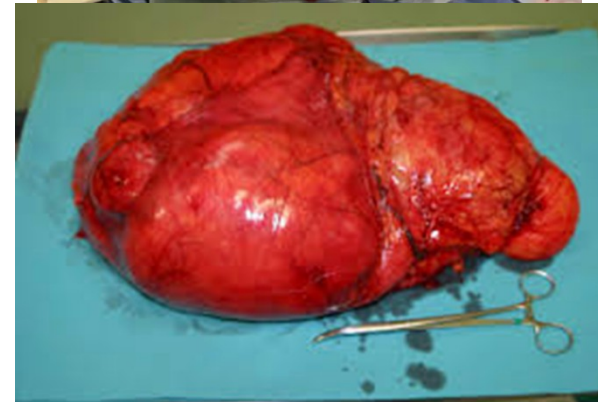
# Lipoma



# Liposarcoma

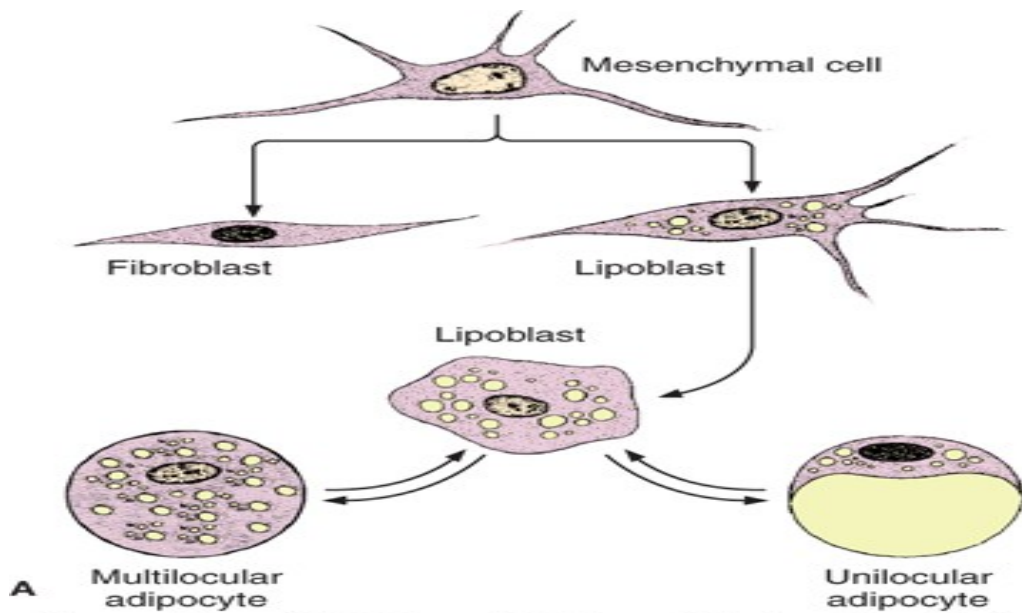


- ❖ **Liposarcoma**: malignant tumor of adipose tissue.
- ❖ They occur in the **fifth to sixth decade**.
- ❖ They arise commonly in the **retroperitoneum** as relatively :
- **large** well circumscribed masses, **non-capsulated** with glistening yellowish cut surface.

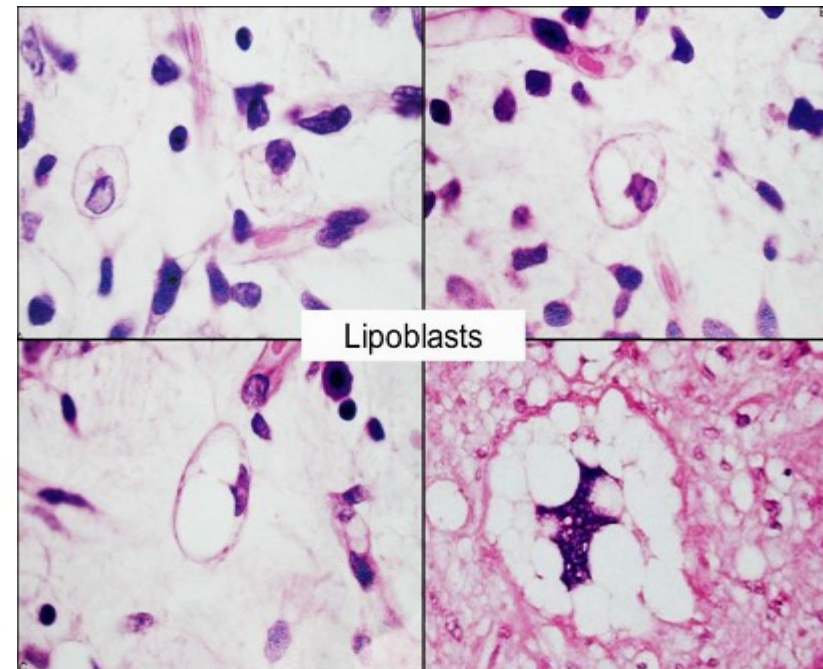




# Liposarcoma

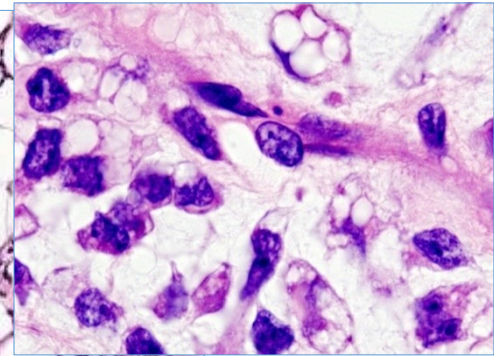
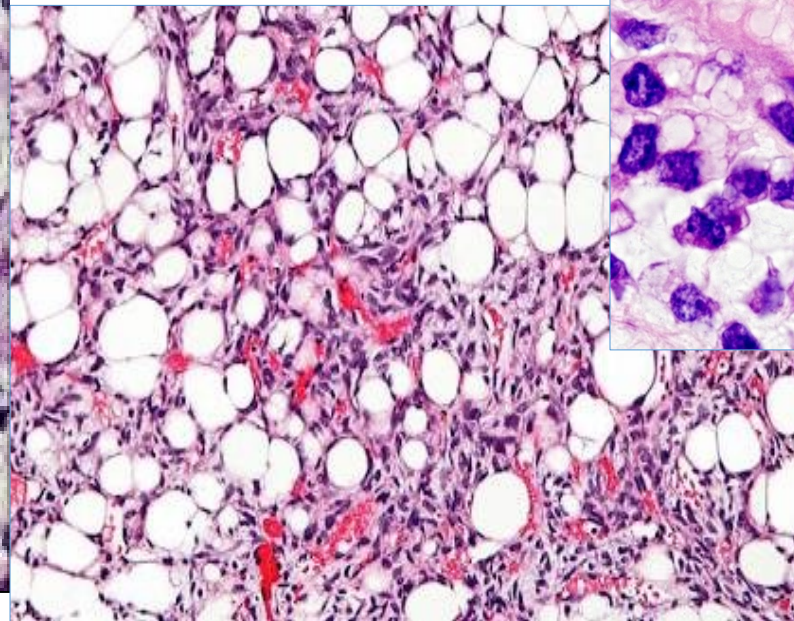
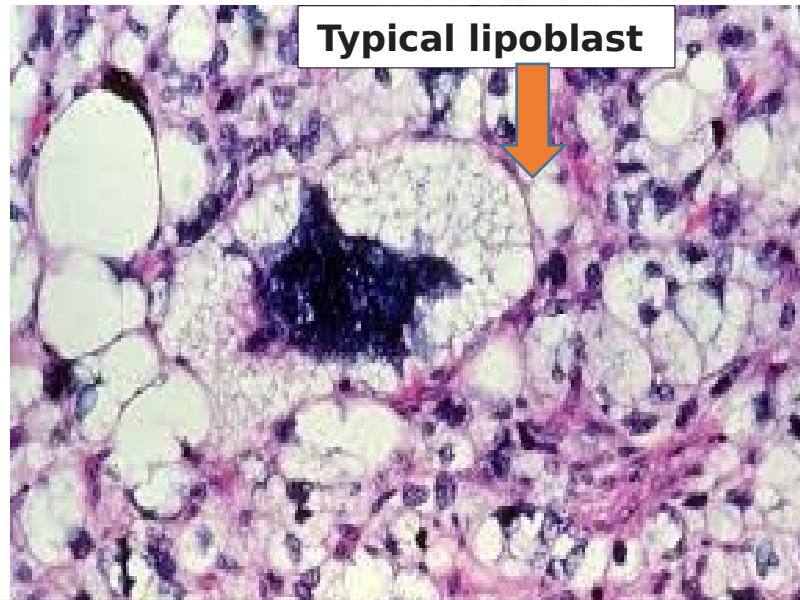


Source: Howard M. Reisner: Pathology: A Modern Case Study  
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Extended Modular Program

# Liposarcoma



## **Lipoblasts**

- Primitive cells indicative of fatty differentiation /**univacuolated** and **multivacuolated**
- Indented atypical nucleus recapitulating fetal fat cells.

*Extended Modular Program*

## Tumors of adipose tissue



### Lipoma



### Liposarcoma





## Tumors of smooth muscle



**1. Leiomyoma:** Benign smooth muscle tumors.

They are common in the **uterus**, and **gastrointestinal tract**.

**2. Leiomyosarcoma:** rare malignant smooth muscle tumors.

Can occur in the uterus, and stomach. Present grossly by a **large bulky fleshy mass** with wide areas of hemorrhage and **necrosis**.

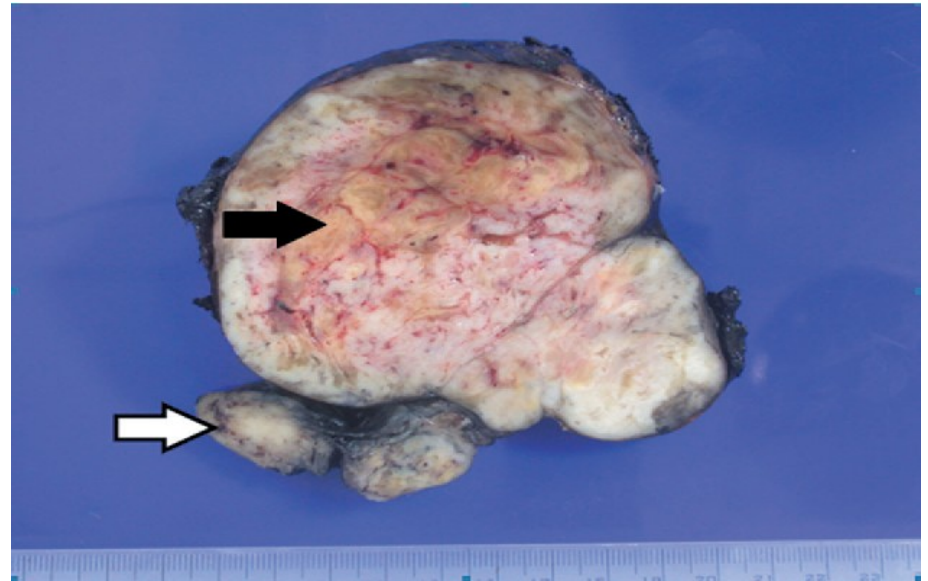
## Tumors of smooth muscle



### **Leiomyoma**



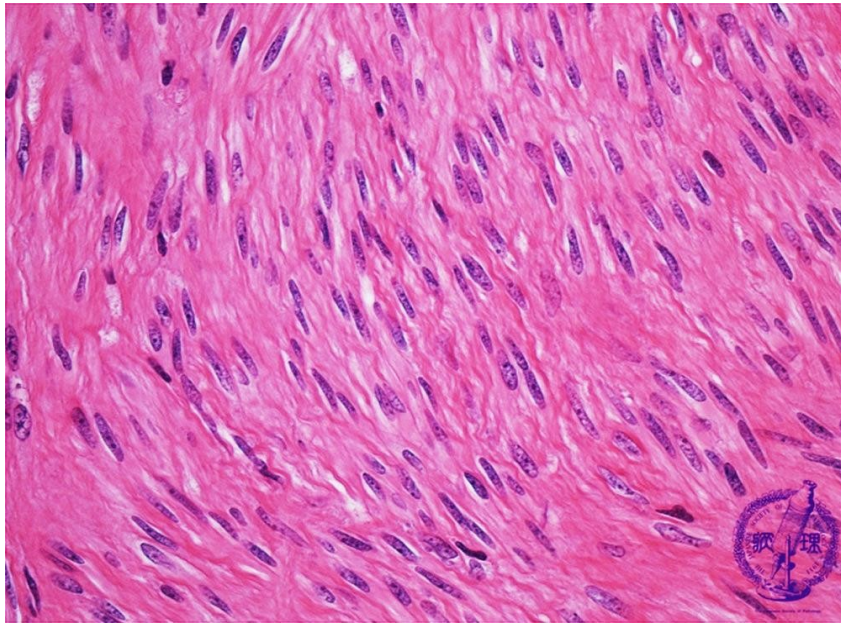
### **Leiomyosarcoma**



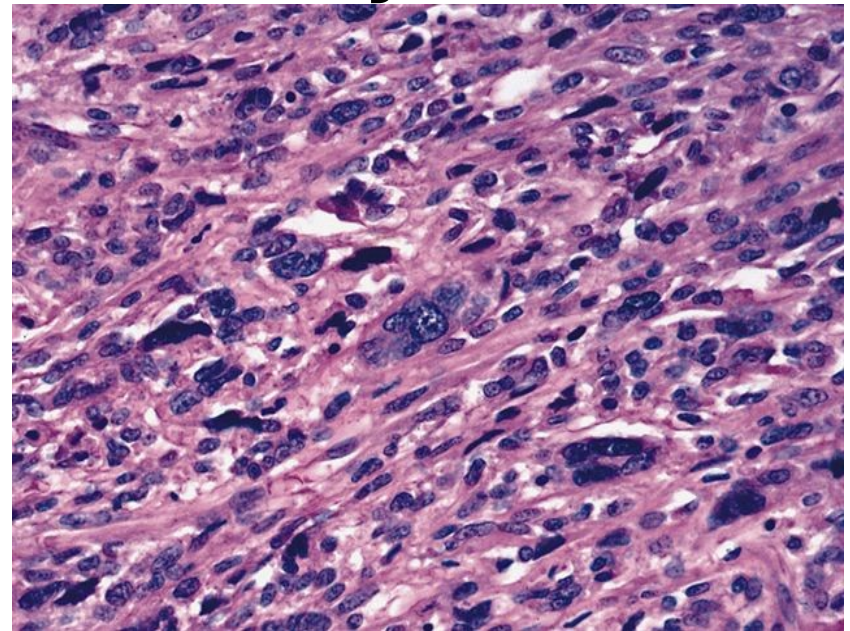
## Tumors of smooth muscle



### **Leiomyoma**



### **Leiomyosarcoma**



## Benign vascular tumors



**1- Hemangioma:** Benign vascular tumor formed of vascular spaces filled with blood commonly seen in infants or children.

- It has two histologic variants:
  1. Capillary hemangioma: **the commonest type**
  2. Cavernous hemangioma.
- **Gross**: It is well defined non capsulated tumor.
- **Microscopic**: It is formed of capillary sized or large vascular spaces lined by endothelium and separated by connective



# Hemangioma



**Capillary hemangioma**  
**cavernous hemangioma**

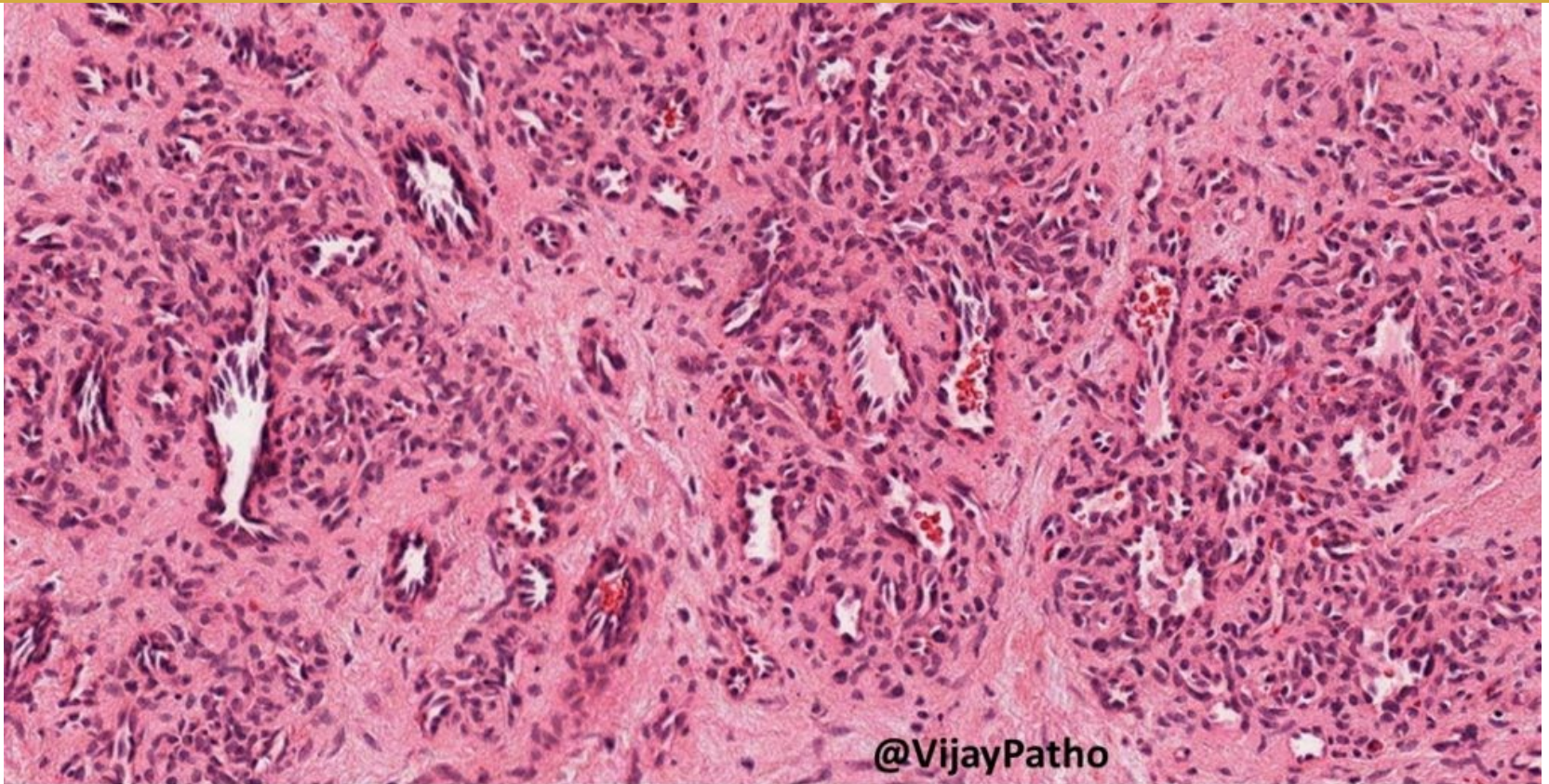


# Cavernous Hemangioma





# Capillary Hemangioma





# Cavernous Hemangioma



Large spaces filled with blood



@VijayPatho



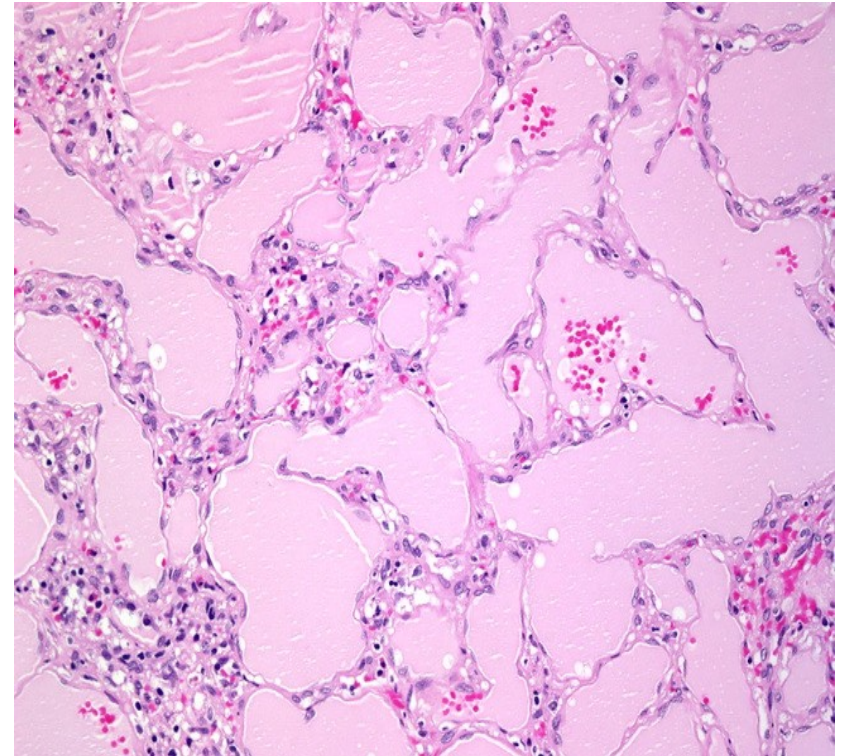
## **Benign vascular tumors**



**2- Lymphangioma:** Benign vascular tumor formed of lymphatic vascular spaces filled with lymph (not blood) & often congenital

- It is well defined non capsulated tumor.
- It is formed of capillary sized or large vascular spaces lined by endothelium and separated by connective tissue stroma rich in lymphocytes.

# Lymphangioma (Cystic Hygroma)





# Osteomyelitis



# Osteomyelitis



## **Definition:**

Inflammation of bone & bone marrow.

### **I- Infection.**

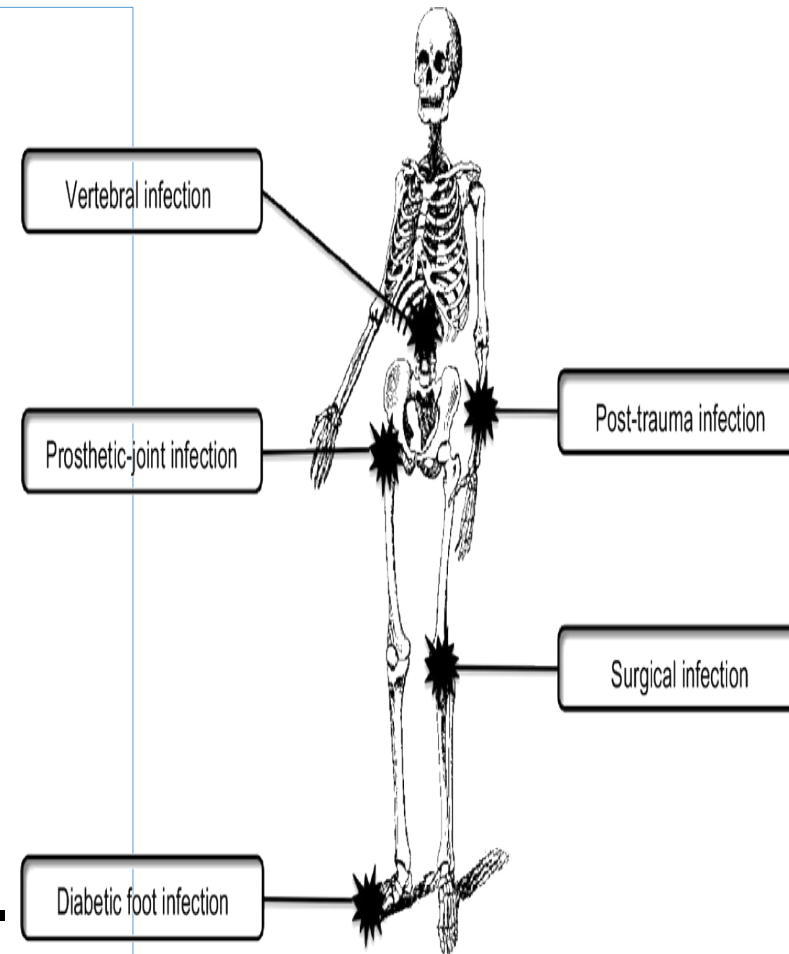
Predisposed by:

A- Trauma or surgical procedure.

B- Vascular insufficiency.

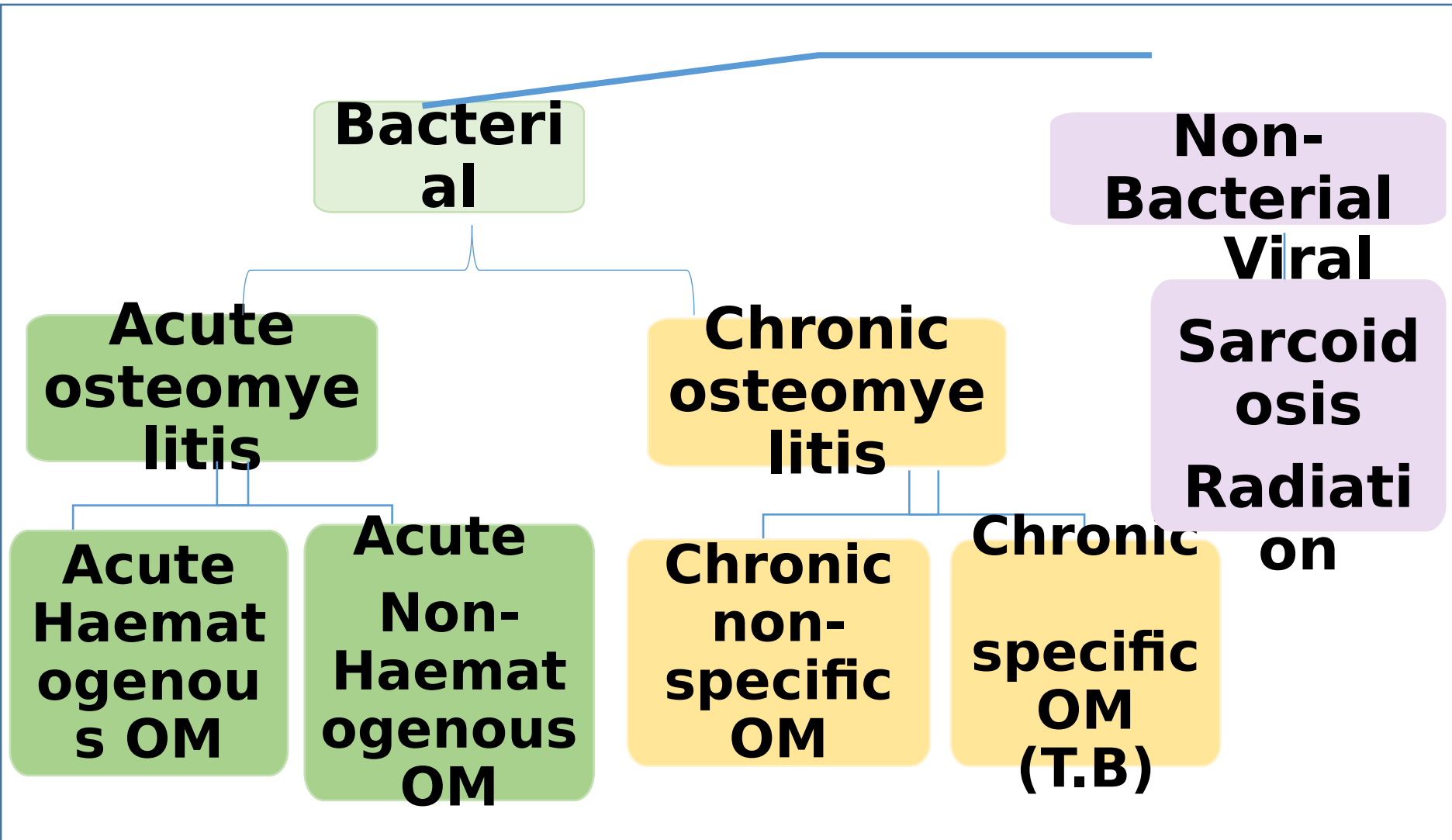
C- Bacterial colonization.

### **II- Non -Infection.**





# Osteomyelitis



# Acute Hematogenous Osteomyelitis



❖ Most common in children

❖ The organisms:

- Staph. aureus in 80-90% of cases
- Less commonly E.coli , Salmonella, Staph albus Pneumococci or Streptococci.



# Acute Hematogenous Osteomyelitis



Throat  
Tonsils  
Teeth



Skin infection  
Paronychia  
Furuncle  
Infected wound



Urinary tract infection



Gastrointestinal infection

*Salmonella*  
Typhoid  
Appendicitis  
Peritonitis  
Umbilical infection



Lung infection  
Pneumonia  
Abscess  
Tuberculosis



**B**

# Acute Hematogenous Osteomyelitis



1. The organisms are derived from remote infections (e.g respiratory, intestinal, urinary, oral, or skin).
2. They reach the blood stream (bacteraemia) following trivial injuries such as intestinal mucosal abrasions during defecation or slight oral mucosal injuries due to





# Acute Hematogenous Osteomyelitis



## Pathogenesis:

The bones most commonly affected

THE LONG BONES □ vertebrae.

The location of the lesions within the affected long bone is influenced by the vascular circulation, which changes with age.



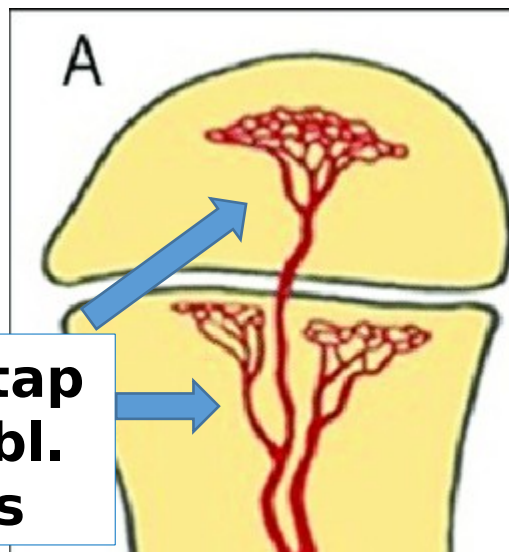
# Acute Hematogenous Osteomyelitis



**Infants < 18 mon.**

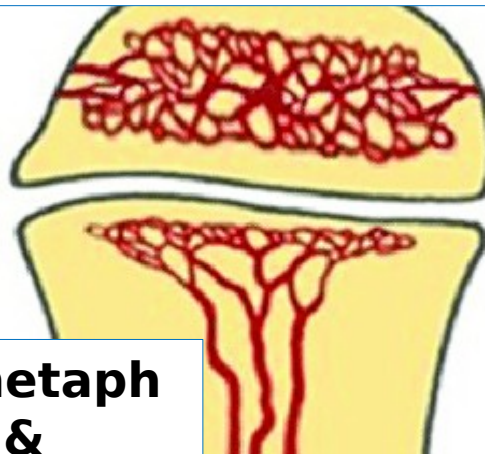
**children (18 mon. to 16 yrs**

**closure of the growth plate**

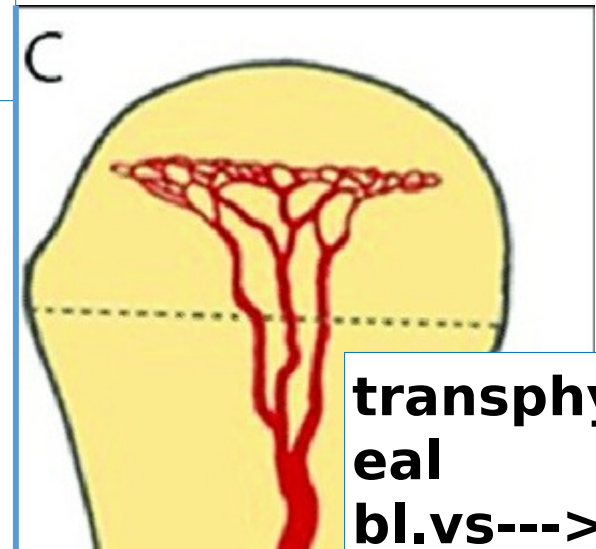


**metaph.  
h. bl.  
Vs**

**epiphysis = its own bl.vs**



**metaph  
v &**



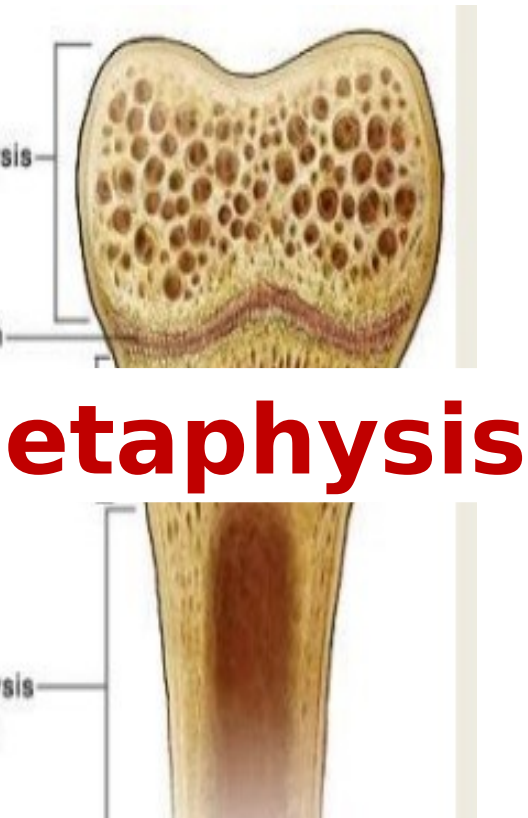
**transphys  
eal  
bl.vs--->**

A natural barrier is formed by the physis preventing spread of OM in the epiphysis and joints. Therefore, children **18 mon. & 16 yrs** will present with an

# Acute Hematogenous Osteomyelitis



## Childr



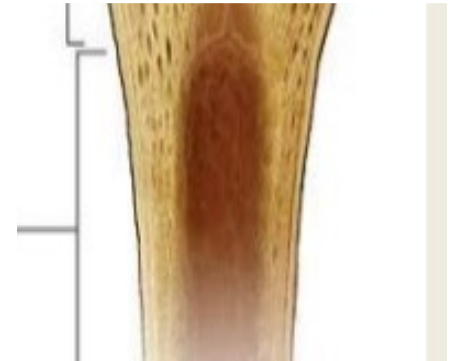
etaphysis

1. The most vascular part of bone
2. The blood flow within the metaphysis is normally slow
3. Metaphysis is the most subjected part of bone to trauma (trauma is known to be a

## Adults



Metaphysis



# Acute Hematogenous Osteomyelitis



## Clinical presentation

- The main hallmark is **fever** with localized **bony tenderness**
- In neonates □ **pseudoparalysis** and pain on **diaper change**





# Pathogenesis of Acute Hematogenous Osteomyelitis

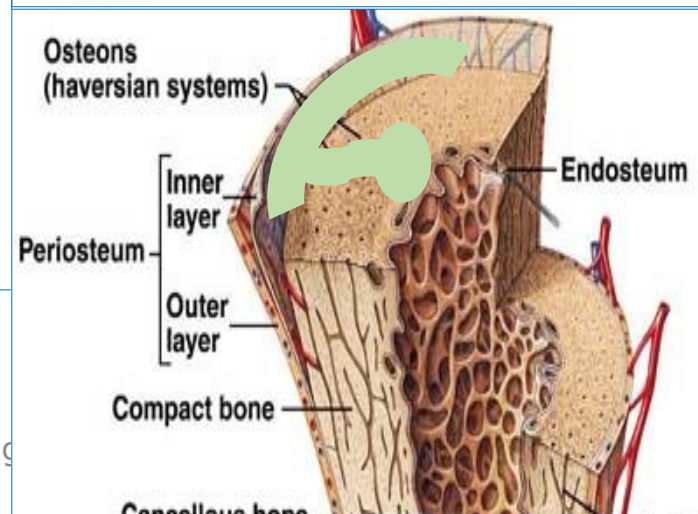
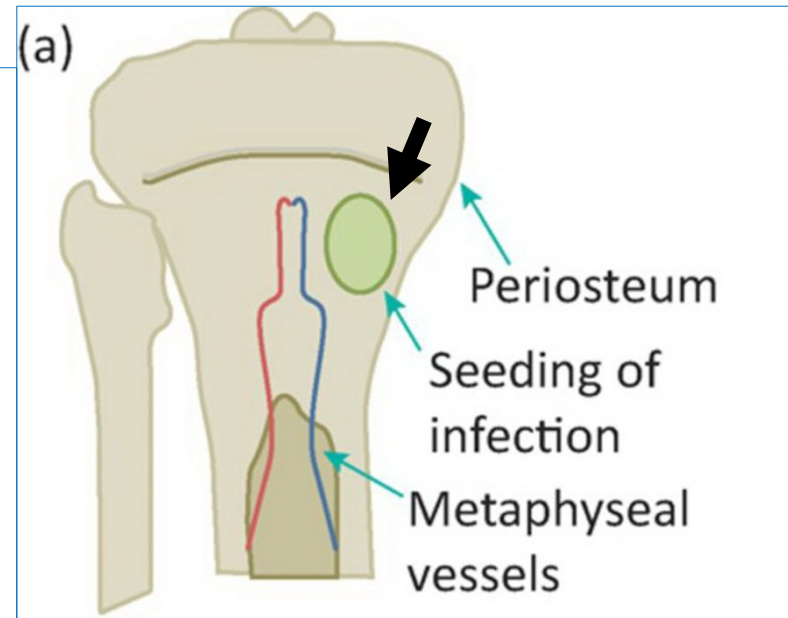


1. The initial lesion is a **suppurative focus** in the **metaphysis**.
2. **Spread** of infection occurs penetrates the **endosteum** ----> through the **Haversian system** --> collects **under the periosteum**

---> **Subperiosteal abscess**

6/11/24

Department of Pathology



# Acute Hematogenous Osteomyelitis

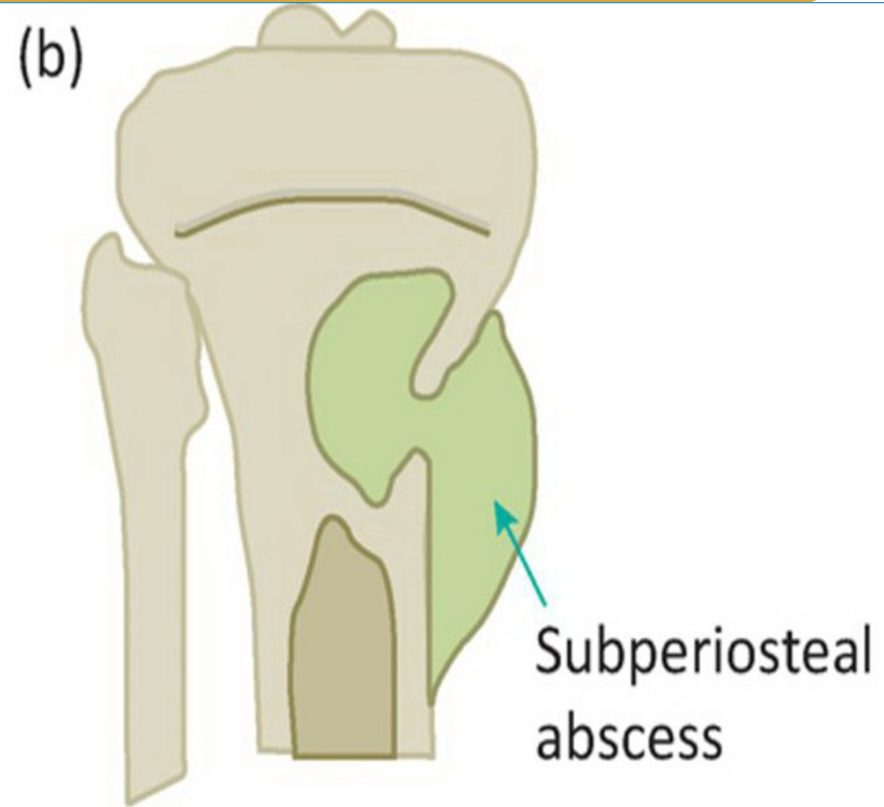


## **3. Bone necrosis**

**due to:**

**A. Bacterial toxins.**

**B. Ischemia due to stretching, compression or thrombosis of periosteal vessels.**

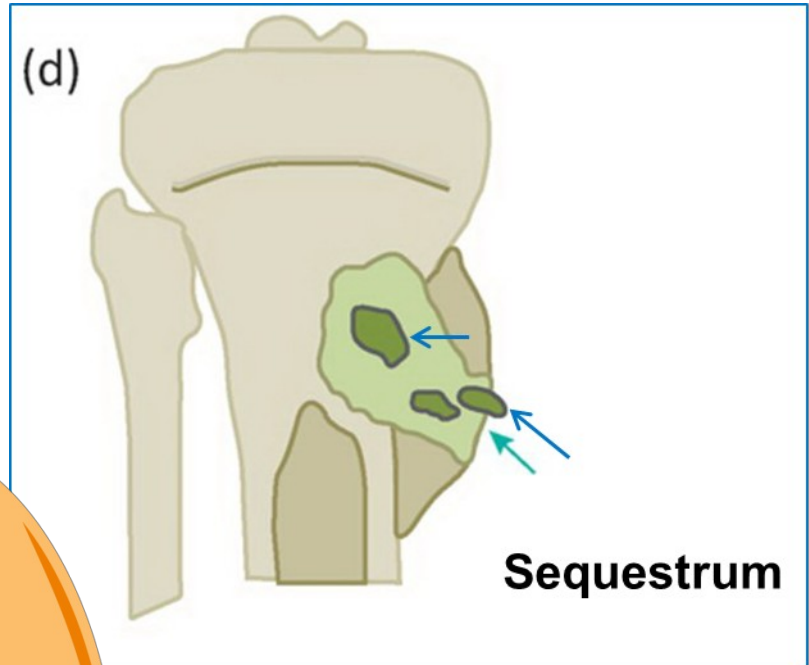
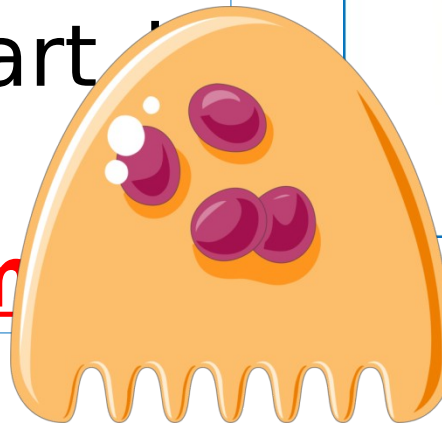


# Acute Hematogenous Osteomyelitis

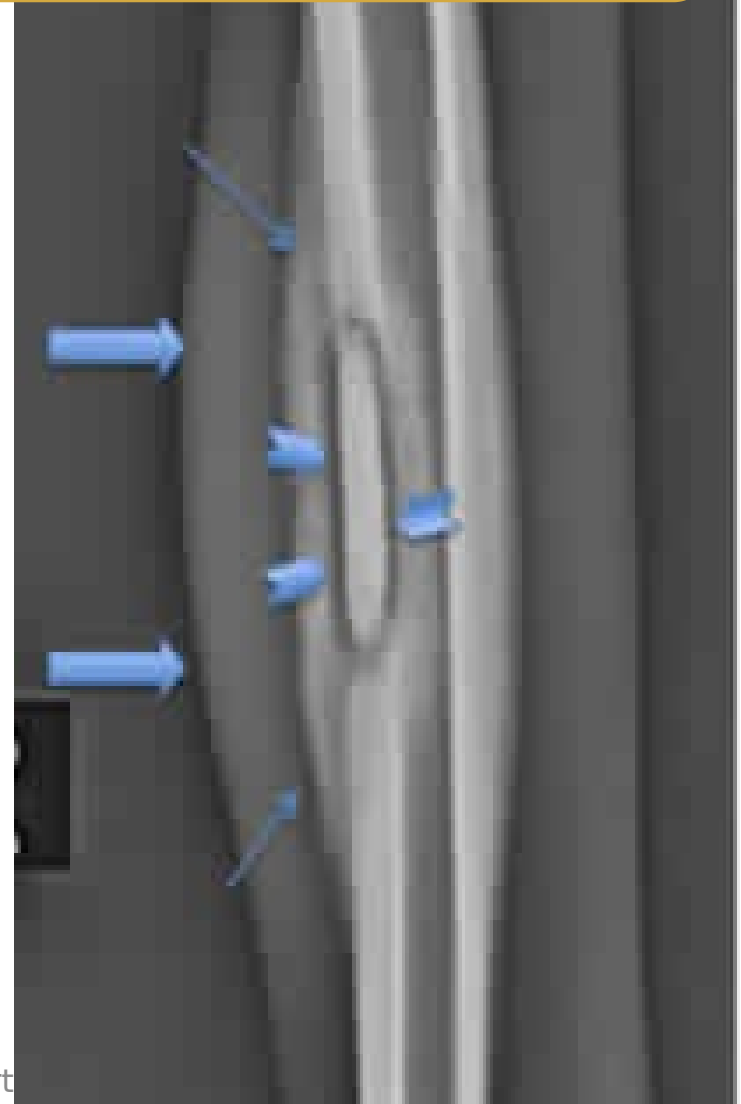


4. Separation of the necrotic bone by action of osteoclasts. This separated part is called

Sequestrum

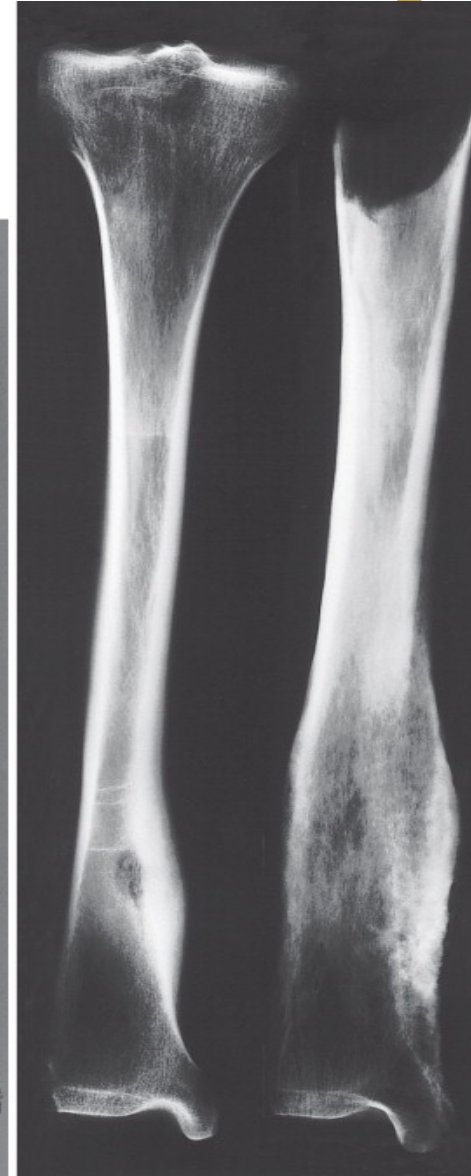
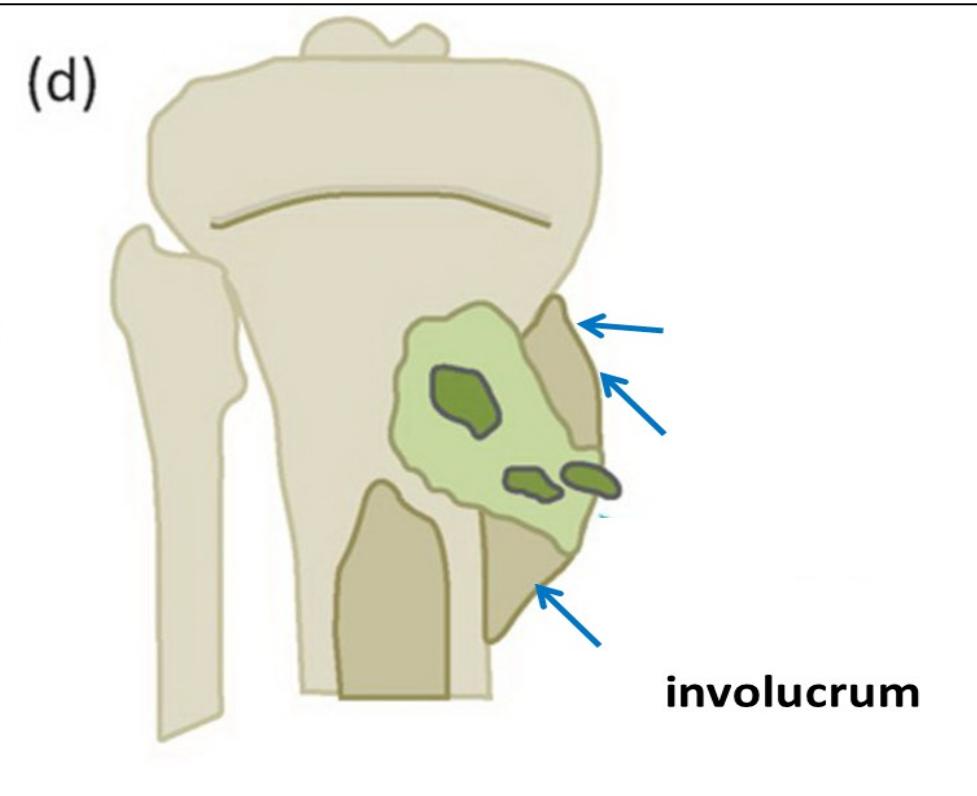


# Acute Hematogenous Osteomyelitis





# Acute Hematogenous Osteomyelitis



# Acute Hematogenous Osteomyelitis

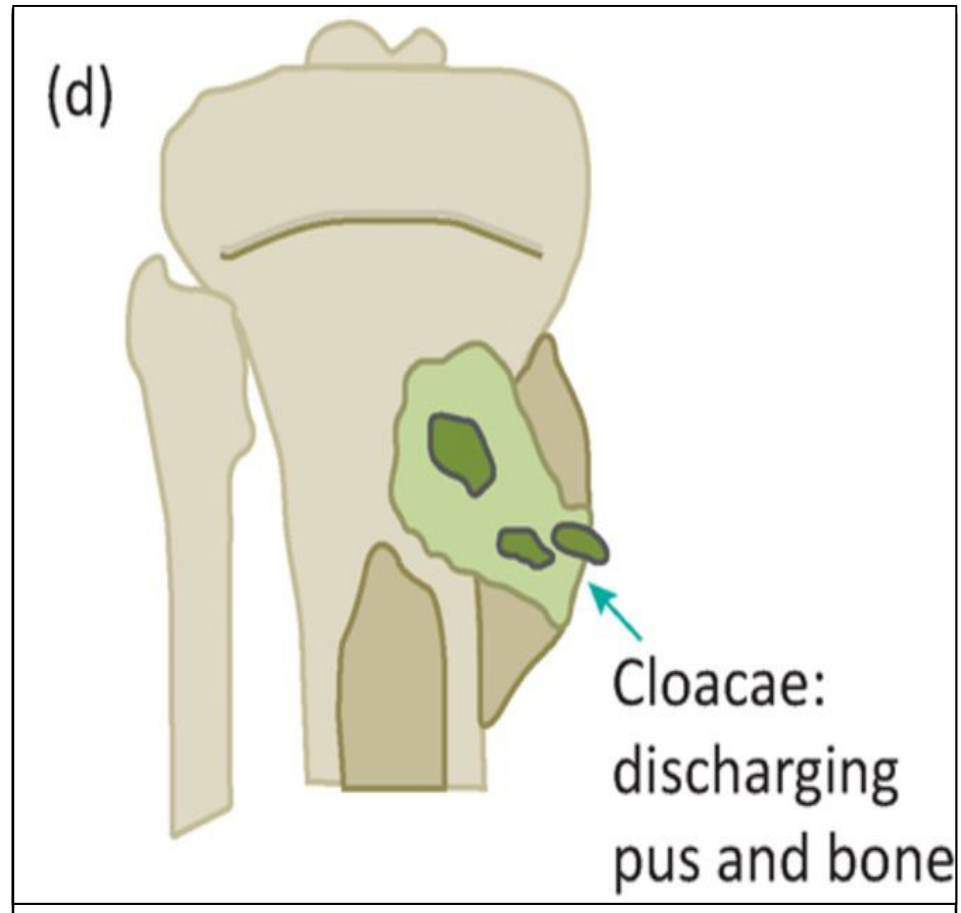


The sinuses now appear as thick-walled holes called **cloacae**.

**This occurs in the chronic phase**

(d)





# Acute Hematogenous Osteomyelitis



## Complications:

1. Pathological fracture.
2. **Direct spread** of infection → arthritis, myositis, neuritis..
3. **Blood spread** of infection → toxæmia, septicaemia and pyaemia.
4. **Chronic suppurative osteomyelitis.**

This may be further complicated by:

a) Secondary amyloidosis.

b) Epithelization of the sinuses which may later give rise to **squamous cell carcinoma**



# Acute Hematogenous Osteomyelitis



## PATHOL

**Osteoclast effect**

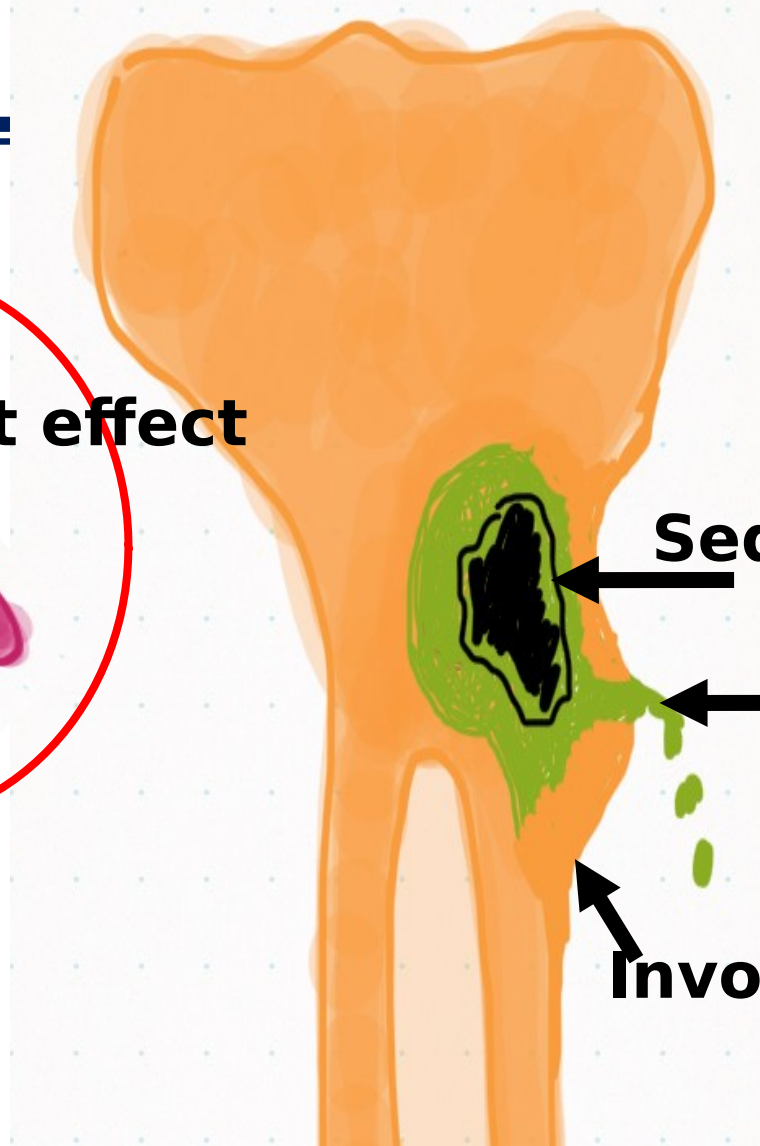


**Blocked vessels compress  
anemia**

**Sequestrum**

**Sinus formation**

**Involucrum**



# Lecture Quiz



**In a 5 years old male patient with painful tender tibial swelling, a necrotic separated bony part is called:**

- 1. Involucrum**
- 2. Sequestrum**
- 3. Cloaca**
- 4. Sinus**
- 5. Abscess**

**Which of the following is a cause of imperfect bone healing:**

- 6. Male gender**
- 7. Young age**
- 8. Hypertension**
- 9. Corticosteroid therapy**
- 10. Exercise**

# SUGGESTED TEXTBOOKS



1. Robbins basic pathology, ninth Edition
2. Kaplan step 1 pathology lecture notes  
2017 (P.78-98)